

The native speech centre is a special hindrance, and the translation habit, although the path of least discomfort, is really a bar to progress. The rate of progress depends upon the intensity of the learner's absorption during the early stage. Inquiry into cases of aphasia among bilingual people may be expected to throw some light upon the nature of brain centres for foreign speech. The attempt to establish two foreign languages at the same time should not be made; each tends to inhibit the other. Latin, however, taken on a translation method does not appreciably interfere. Progress is hindered by the incapacity of some scholars to perceive new sounds.

The discussion on the *Examination and Inspection of Schools* was started by Prof. Armstrong, who asserted the need for freedom to develop individuality. The ideal system would be for the schools to examine themselves with the aid occasionally of competent assessors. Mr. W. M. Heller spoke on the constructive work of an inspector of schools. The transition from payment by results to inspection was accompanied for some years by a diminution in the proficiency of pupils. An inspector should possess successful teaching experience in both primary and secondary schools, if possible with the wider outlook of a headmaster. It takes time to know a large number of schools and teachers, and first impressions are sometimes wrong; hence an inspector should be left for several years in the same district. An inspector has a magnificent field for scientific research; he can watch, foster, and institute educational experiments of all kinds. The Rev. E. C. Owen doubted whether the inferior teacher well inspected was an improvement on the good teacher uninspected. Training would never eliminate mediocrity. If practical experience in teaching were made a *sine qua non* for administrative posts, this would attract good men to educational work.

A joint meeting was held with Sections A and G to discuss the *Teaching of Mechanics by Experiment*. Mr. C. E. Ashford spoke of the results obtained at Dartmouth by the cooperation of schoolmaster and engineer, and the use of real machinery instead of scientific toys. The science master who plays with laboratory toys is apt to be too academic, and the technical schools are too rule-of-thumb, lacking the rigorous mathematician and trained educationist; but the finest of laboratory toys were the delightful trolleys and vibrating springs shown by the lecturer and used by his pupils for measuring velocity, acceleration, and momentum.

Those who attended Section L greatly enjoyed Prof. Sadler's chairmanship, "serious and sunny." His summing up at the close of each day's discussion pointed through primitive chaos to the spirit of search, the growing desire for educational unity, and the fading away of narrow aims.

HUGH RICHARDSON.

INTERNATIONAL TESTING CONGRESS.

IN NATURE of September 6 (p. 471) brief reference was made to the opening of the International Testing Congress at Brussels on September 3. The work of the sections began on September 4, and was continued on September 5 and 6. The amount of work to be dealt with was so considerable that three sections were formed, A dealing with metals, B with building stone and cement, and C with other materials. Altogether there were twenty-seven reports of committees and forty-five original papers, the greater portion of which were submitted to the section on metals. Mr. J. Magery (Namur) presided over this section, and he was supported by honorary presidents representing the various nationalities present, and including Messrs. Wedding (Berlin), Brough (London), Saladin (France), Hackstroph (Holland), Chernoff (Russia), Brinell (Sweden), Popper (Austria), and Tonello (Spain). The following are brief notes on the various reports presented:—

Mr. A. Rieppel (Nuremberg) reported on the introduction of standard specifications in various countries; Mr. W. Ast (Vienna) reported on methods for inspecting and testing in order to ensure uniformity in iron and steel; Mr. R. Krohn (Danzig) reported that it was not feasible to establish standard welding tests. Prof. E. Heyn (Berlin), reporting on the value of etching malleable iron

for the investigation of structure, showed that examination by the unaided eye gave valuable information as to the character of quenched high-carbon steel. Prof. N. Belebubsky (St. Petersburg) reported on the unification of methods of testing, and submitted a series of proposals. Prof. H. M. Howe and Mr. A. Sauveur submitted proposals for the uniform nomenclature of iron and steel. Dr. R. Moldenke (New York) reported on the establishment of standard methods of testing cast-iron and finished castings. He noted that the American and German specifications differ but slightly, and could easily be made identical.

Mr. E. Sauvage (Paris) submitted a report on impact tests on notched bars, and there was an animated discussion as to the value of this method of testing, opinions being equally divided as to the desirability or not of recommending it in specifications. The Brinell hardness test, which was reported on by Mr. J. A. Brinell and Mr. G. Dillner (Stockholm), was also keenly discussed, the general opinion being that, with the view of placing information on record, tensile tests of metals should, when possible, be supplemented by tests by the Brinell method. Mr. W. Ast (Vienna) submitted a report on international researches in the macroscopic examination of iron. The etching test is recommended for preliminary examination. Lastly, Mr. F. Osmond and Mr. G. Cartaud (Paris) submitted an interesting report on the progress of metallography since the Budapest congress of 1901.

The second section, dealing with cements, was under the presidency of Mr. Levie (Charleroi). The subjects discussed included the determination of the adhesive force of hydraulic cement, the determination of the weight of a litre of cement, and the behaviour of cement in sea-water. It was decided to appoint a committee to inquire into reinforced concrete.

The third section, under the presidency of Mr. E. Roussel (Malines), devoted attention to tests of paints, linseed oil, wood, bitumen, asphalt, and india-rubber. The congress concluded with a lecture by Prof. H. Le Chatelier (Paris) on the practical applications of metallography. An interesting feature of the congress was a small laboratory installed to illustrate modern methods of testing, under the direction of Prof. Le Chatelier, Mr. Guillet (Paris), and Prince Gagarine (St. Petersburg). It was decided that the next congress should be held in 1909 in Copenhagen under the presidency of Mr. A. Foss, president of the Society of Danish Engineers.

THE ANTI-TUBERCULOSIS CAMPAIGN.

THE Hague, preparing to receive the great Peace Congress of 1907, which is to discuss questions of peace and disarmament, recently entertained delegates from the chief European and American States to the fifth International Conference on Tuberculosis. At this conference questions of increased armaments were discussed, with the view of waging a more effective war against this great evil. The great interest taken all over the world in the proceedings of the conference testifies to the awakening of mankind to the necessity of making further and greater efforts in order to reduce the ravages of tubercular infection to a minimum.

At the present time the campaign against tuberculosis is being carried on with greater energy than at any previous period in medical history. Since Koch's discovery of the tubercle bacillus in 1882, and the publication of his exhaustive researches arising therefrom, it has been known to medical men that tuberculosis is as much a preventable disease as plague or cholera. Nevertheless, the public in England have remained until very recently apathetic and apparently indifferent to the fact that untold misery and sixty thousand actual deaths occur annually from a disease which can and ought to be eradicated. At last we are waking from our lethargy. This change has been gradually induced by the insistent pressure of medical opinion, aided largely by the King's active sympathy and interest. More lately Prof. Wright's great work on "opsonins" has given fresh hope and energy to many who were becoming jaded in an apparently hopeless conflict.

Since 1851 statistics show a steady decline in the mortality of tuberculosis, and for this the principles of general sanitation have been chiefly responsible. We may expect in the future that this improvement will be maintained by the continued prevention of overcrowding, the enforcement of good ventilation, improvement of insanitary areas, more effective drainage, better cleansing of streets, and the more stringent supervision of meat, cowsheds, dairies, &c.; but more rapid progress may be made and eventual extinction of the disease attained if more direct measures are employed in an intelligent and comprehensive manner.

Of more direct measures, hospitals for consumption have no doubt played a part in the decline of phthisis, but anyone acquainted with the conditions of life obtaining in our great centres of population must admit that their sphere of usefulness is but limited. The reasons for this are not far to seek:—firstly, hospital treatment is practically useless for cases of advanced tuberculosis, and most hospitals refuse admission to patients suffering from a widespread infection; secondly, patients well fed and passing a restful existence in hospital under the best hygienic conditions rapidly break down on again returning to their homes, where such favourable conditions are impossible. The recognition of this latter fact has led to the erection of sanatoria in various parts of the country, where patients may continue for a time to build up their powers of resistance after leaving hospital, and where they may by graduated exercise under proper medical supervision steadily fit themselves for the more arduous work of ordinary life.

At the present time the number of sanatoria is limited, and hopelessly inadequate for the work. Efforts are, however, being made all over the country to increase their number, but the cost of building and the cost of maintaining an efficient sanatorium is a practical difficulty with which we are faced at the outset. The King's Sanatorium at Midhurst, perhaps the most perfect of its kind in the world, cost approximately 1000*l.* per bed. Having regard to the number of beds required all over the country, a cost anything approaching these figures is prohibitive. The Open-air League, however, has directed its attention to this point, and has as one of its principal objects the erection of sanatoria at a cost estimated at not more than 100*l.* per bed, including complete equipment and the freehold of the ground. At Woodilee and Gartloch Asylums (Scotland) wood and iron sanatoria have been erected at a cost of 90*l.* per bed. If satisfactory headway is to be made we must have more sanatoria, and from the nature of the case they must be erected as cheaply as possible.

Another philanthropic body, under the presidency of H.R.H. Princess Christian, called The National Committee for the Establishment of Sanatoria for Workers Suffering from Tuberculosis, having similar objects in view, recently purchased 250 acres of land in Kent, and is about to build a sanatorium for poor patients; the committee expects that the institution will be self-supporting, without endowment from local rates or private charitable subscriptions. These organisations are working along the right line and doing splendid work, but so great is the number of tuberculous patients (80,000 in London alone) that they are only able to touch the fringe of this tremendous problem.

Hitherto sanatorium treatment has mainly consisted of fresh air, rest in bed, full diet, and graduated exercise under constant medical supervision. Such a life is not a very healthy moral existence; it produces the "sanatorium habit," which renders one who has acquired it morally unfit, as he is already physically, for the more strenuous life to which he must sooner or later return. In order to counteract the emasculating influence of sanatorium life as hitherto pursued, to reduce the cost of maintenance, and in order to provide work for patients who would otherwise lead an indolent and purposeless life, various schemes have been proposed.

The Open-air League intends to found farm colonies in connection with its sanatoria where patients cured, but as yet unfit to return home, may occupy themselves in farming, in the cultivation of vegetables, and other similar light occupations. An intermediate stage is thus created during which the patient is braced up physically and morally, and his tendency to relapse reduced to a minimum. Hospitals and sanatoria, however, under their rules exclude

cases of advanced tuberculosis. Such cases under hospital treatment remain stationary or get worse, and merely occupy beds which may be more usefully employed in the treatment and cure of patients less extensively infected. Advanced cases, then, added to the many who for various reasons prefer to remain at home, are under no control, and constitute a constant and very real menace to the health of the general public. How to reach these patients and bring them under proper medical supervision is in most localities a great difficulty, yet until it is dealt with all hope of eradicating tuberculosis may be abandoned. In London there appears to be no organisation as yet which will undertake this necessary work. The difficulty has been met in Scotland by the founding of "dispensaries for tuberculosis," and this example has been followed in France and Belgium. In Germany, too, similar institutions (Wohlfahrtstellen für Lungenkranke) have been founded. The functions of a dispensary are briefly these:—

(1) Medical examination of patients.

(2) Inquiry by a medical man or nurse into the history of the illness, the home conditions, the economic condition of the family, the suitability of the accommodation for home treatment.

(3) Arrangements for providing medical treatment and nursing of patients that could be treated at home without risk of infection.

(4) Dispensing of medicines and disinfectants.

(5) Selection of cases suitable for hospital treatment.

The type of dispensary which might well be copied by other cities is the Royal Victoria Dispensary, founded eighteen years ago by Dr. R. W. Philip in Edinburgh. The excellent work done by this pioneer institution has been of incalculable benefit to the community.

By these means the campaign is carried into the very homes of the patients, and an attempt is made to limit at its source the constant stream of more or less advanced cases of tuberculosis which appear daily in the out-patient departments of our hospitals.

The cost of such dispensaries is not great; Dr. Philip estimates it at 500*l.* to 1000*l.* per annum for a city of 300,000 inhabitants. It might be paid out of the rates, and the dispensaries, for administrative purposes, should be under the control of the medical officer of health.

Pulmonary tuberculosis has been recognised in Scotland by the Local Government Board as an infectious disease within the meaning of the Public Health Act (Scotland), 1897; consequently the obligations of the local authority with regard to infectious disease are extended to phthisis, and much more efficient control is established.

Under the Infectious Diseases Act (1889) the Local Government Board can invest local authorities with similar powers. In Sheffield these powers have been obtained in a modified form, and in Manchester and some other localities notification of tuberculosis has been tried with success.

Surely the time has now arrived when the powers possible under the Infectious Diseases Act should be more generally employed. A system of voluntary notification has been inaugurated in Manchester; this was at first limited to public institutions, but in 1900 medical men were invited to notify the cases occurring in their private practice. The system has worked well, and has been of immense benefit in affording opportunities for visiting the homes of the patients and instructing them in the principles of disinfection, ventilation, and the proper disposal of sputa, &c. It cannot be doubted that some system of notification (voluntary or compulsory) is imperative if efficient control is to be obtained. It is not contended that notification by itself has any administrative value, but if efficiently followed up by adequate preventive measures it would alter the whole aspect of affairs; on the other hand, application of the provisions of the Public Health Act to tuberculosis is impossible unless some system of notification is employed.

Many new cases of infection arise from ignorance of the infectivity of tuberculosis, and from an absence of any knowledge as to how best to live without spreading infection. To combat this local authorities have distributed leaflets conveying simple instructions for the everyday life of tuberculous persons, and various philanthropic bodies (e.g. the Open-air League) have this education of the public as one of their chief objects.

Brighton, however, under the able leadership of Dr

Newsholme, has struck out a new line. The vacant wards of the hospital are utilised for the education of consumptives. Patients living at home are admitted to the hospital for short periods (four to six weeks), during which time they are instructed as to how they should live and in all the precautions and preventive measures they should practise on returning to their homes. In this way a constant stream of enlightened information is continually disseminated among the most ignorant. Some other towns are following this excellent example.

Although it has been shown that much time, money, and energy are being expended by various public and private bodies in the effort to throw a net over the whole tuberculous population, yet it must be confessed there remain many gaps which must be filled up if success is to be attained in our war against consumption. Proper organisation and coordination of effort are needed. A well-thought-out scheme must be put in action throughout the country and controlled by some central authority. This duty falls naturally to the Local Government Board, and is it too much to expect that a "tuberculosis committee" of that board may be appointed the chief duty of which should be the control and direction of the isolated efforts now being made in various parts of the country? By this means greater efficiency and better results would accrue at a proportionately smaller cost. R. FIELDING-OULD.

ATMOSPHERIC ELECTRICITY IN ALGERIA.

IN the *Revue générale des Sciences* of May 30, M. Ch. Nordmann gives an account of the phenomena of atmospheric electricity, and of one or two of the latest theories on the subject, and also describes some recent observations made by himself in Algeria. Atmospheric electricity is now so large a subject that the essay naturally covers only a part of the ground, and does not go into many details. It shows, however, the clearness and lightness of touch one expects from our neighbours across the Channel. In a few points perhaps its conclusions are a little precipitate, but it contains some shrewd criticisms of other people's theories. The paper contains copies of some interesting electrograms, mostly obtained by the author in August and September, 1905, at Philippeville, on the southern coast of the Mediterranean.

M. Nordmann first points out that the normal potential gradient in the atmosphere may arise from a negative charge on the earth, or a positive charge in the air, or from the two combined. He regards the presence of an excess of positive electrification in the air as proved by the fall in the potential gradient with increasing height observed in balloon ascents. He refers to Elster and Geitel as having discovered that any charged body, however well insulated, loses its charge in ordinary atmospheric air. Historically this is hardly complete, as Elster and Geitel merely confirmed what Linss had discovered many years before. Elster and Geitel have, of course, added enormously to our knowledge of the subject, and they gave it much greater precision, besides bringing it into line with recent laboratory research.

Passing to the diurnal variation in the potential gradient, p. 445, M. Nordmann refers to the double period with maxima about 8 a.m. and 8 p.m. as having been regarded until recently as universal. He next refers to observations on mountains, especially those on the Sonnblick, as showing that at high levels the afternoon minimum disappears, the diurnal variation becoming simple, and mentions Chauveau as having established the existence of the same phenomenon on the Eiffel Tower. In both cases the observations show rather a reduced prominence in the afternoon minimum than its total absence, and on p. 447 Nordmann somewhat qualifies his earlier remarks. His own observations at Philippeville supply a very interesting example of a simple period. Observing on an eminence 160 metres high, immediately adjacent to the sea, he obtained as the mean from the quietest days of his stay (the number of which is not stated) a diurnal variation with a minimum from 4 a.m. to 5 a.m., and a maximum about 5 p.m. The value was above the mean from 11 a.m. to 10 p.m., and below from 11 p.m. to 10 a.m. During the day the wind blew straight from the sea, and during the night from the land. The results are so unusual, and

if confirmed so suggestive, that an extension of the observations over a much longer period is desirable. Until that is done, one cannot feel sure that the results are fairly representative, even of the particular season of the year when they were observed. Among the electrograms reproduced is one showing the effects of a sirocco from the desert. The large and sudden changes of potential, the curves going off the sheet both in the positive and negative directions, are similar to those met with in England during thunder or heavy rain. Other curves of interest are those showing the changes of the potential and of the positive ionisation of the air at Philippeville during the total eclipse of the sun on August 30, 1905. Between the times of the first and last contacts the potential was slightly above its mean for the time of the day, and the ionisation fell decidedly as totality approached. The maximum in the one curve and the minimum in the other occurred forty-five minutes after totality.

In his criticisms of theories by Elster and Geitel and Ebert the author points out that at Philippeville the potential was below, not above, its mean when the wind blew off the land, and that the barometric pressure showed the ordinary double period. In discussing some theoretical views of his own, he refers to a difficulty in that "en passant de l'été à l'hiver la diminution du rayonnement solaire s'accompagne d'un abaissement du champ, en passant du jour à la nuit elle coïncide, au contraire, avec une augmentation." This is rather puzzling in view of the author's perfectly correct statement, p. 446, that the potential is highest in winter. C. CHREE.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE University of Greifswald has received a legacy of 60,000 marks under the will of the late Dr. Milschewsky, who died recently in Loburg.

PROF. MORRIS TRAVERS, F.R.S., professor of chemistry at the University College, Bristol, has been appointed director of the Indian Institute of Science which is to be established in Bangalore.

ACCORDING to the *Chemiker Zeitung*, the authorities of the Zürich University have decided to increase considerably the University lecture and laboratory fees chargeable to foreigners, with the idea of lessening to some extent the present high percentage of foreigners who attend.

IN the columns of the *Chemiker Zeitung* for last week we read that the Grecian Government recently received from St. Petersburg a legacy of about eight million roubles, or 1½ millions sterling, which was left in the beginning of the last century by a rich Grecian merchant, of the name of Dombolis, with the condition that after the lapse of a definite time a second Grecian university should be built in Corfu out of the capital and interest, and be called the Kapodistrias University.

THE fees for the examinations of the German technical high schools have been fixed on the following scale:—for the preliminary diploma examination, 60 marks for naturalised Germans, 120 marks for foreigners; for the diploma examination, 120 marks for Germans and 240 marks for foreigners; for the doctor of engineering examination, 240 marks, of which the first half is to be paid when the examination thesis is handed in, and the remainder before the oral examination is taken.

THE university buildings of Groningen were almost completely destroyed by fire on August 30. The fire is supposed to have been caused by careless use of benzine or methylated spirits on the part of workmen. The natural history museum and the chemical and pharmaceutical laboratories were entirely destroyed, while the hygienic and physiological laboratories were saved. The university buildings, which, strangely enough, were not insured, were erected in 1846–1852. An emergency committee has made arrangements for the lectures and classes of the coming session to be begun as usual. The University has approximately five hundred students.

THE prospectus of the Borough Polytechnic Institute for the session 1906–7 contains abundant proof that the educa-